

REMARKS

Claims 1-13, 15-20, 44 and 55-74 are all the claims pending in the application. New claims 55-74 are added, above, to further define the invention. Claims 1-13, 15-20, and 55 stand rejected on prior art grounds. Claim 44 is allowed. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1, 4, 7, 8, 11, 18-20 and 55 stand rejected under 35 U.S.C. §102(b) as being anticipated by Taur et al. (hereinafter "Taur"). Claims 2-3 and 12-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Taur. Claims 5 and 17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Taur in view of Uesugi et al. (hereinafter "Uesugi"). Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Taur in view of Pfister. Claims 9, 10 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Taur in view of Yamanaka. Applicants respectfully traverse these rejections based on the following discussion.

A. The Rejections Based on Taur

With respect to independent claim 1, Applicants note that Taur does not teach or suggest "wherein said channel region includes an extension into said source and drain regions." Taur teaches a substantially rectangular channel region as shown in Figure 3 and therefore cannot teach or suggest that "said channel region includes an extension into said source and drain regions" as defined by independent claim 1. These extensions are formed as shown in Applicants' Figure 9 and are also illustrated in the figures that follow Figure 9. In column 3, lines 13-22, Taur explains that the silicon 18 (Figure 1C) is grown from the slot 16 (Figure 1B) to form the silicon for the channels and the source/drains. This silicon growth process is

described in Taur as a single process. To the contrary, the inventive structure is formed in a process (Applicants' Figure 9) that epitaxially grows the extensions separate from the source/drain structures (Applicants' Figure 13). Therefore, it is Applicants position that Taur does not teach or suggest the invention defined by independent claim 1 because Taur does not teach or suggest "wherein said channel region includes an extension into said source and drain regions" as defined by independent claim 1. Therefore, independent claim 1 is patentable over Taur.

With respect to the rejection of independent claim 11, which defines that the "material selection of said first gate dielectric and said second gate dielectric is independent of said source and drain dielectrics" Applicants note that Taur does not teach or suggest such a structure. More specifically, in Taur the gate dielectric 20 is the same dielectric that separate the source and drain from the gates and cannot present a situation where the "thickness and material selection of said first gate dielectric and said second gate dielectric is independent of said source and drain dielectrics" as defined by independent claim 11. In column 3, lines 36-40 Taur explains that the oxide 20 is formed on the channel regions and source/drain sidewalls in a single processing step.

This requires that the gate dielectrics and the source/drain dielectrics be the same material. Since Taur uses the same material as gate dielectrics and source and drain dielectrics, it cannot teach or suggest that the "material selection of said first gate dielectric and said second gate dielectric is independent of said source and drain dielectrics" as defined by independent claim 11. Therefore, independent claim 11 is also patentable over Taur.

With respect to the rejection of independent claim 55, Taur does not teach or suggest a structure where "the crystal orientation of said single crystal channel is independent of said crystal orientation of said substrate" or any process for making such a structure. More specifically, because the invention uses a bonding process to attach the single crystal channel material, the orientation of the single crystal channel material is completely independent of the substrate structure to which it is bonded. To the contrary, as shown in Figure 1C of Taur, and as explained in column 3, lines 14-17, the silicon 18 is epitaxially grown from the silicon substrate 2. This epitaxial growth process in Taur requires that the channel region have the same crystalline orientation as the substrate material from which it is grown. Thus, Taur cannot teach

or suggest that the substrate and channel regions have different crystalline orientations as is achieved with the claimed structure because of the inventive bonding process used to form the claimed structure. Therefore, Applicants also submit that independent Claim 55 is patentable over Taur.

Therefore, as shown above, it is Applicants position that independent claims 1, 11, and 55 are not anticipated or rendered obvious by Taur. Further, dependent claims 2-4, 7, 8, 11-13, and 18-20 are similarly patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the additional features of the invention they define. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw the anticipation and obviousness rejections that are based upon Taur.

B. The Rejection Based on Taur in view of Uesugi

The Office Action makes reference to Uesugi for the limited purpose of showing a planar structure. However, Uesugi is not referenced (and does not teach) the deficiencies of independent claims 1 and 11 that are mentioned above. More specifically, Uesugi does not teach or suggest "wherein said channel region includes an extension into said source and drain regions" as defined by independent claim 1 or that the "thickness and material selection of said first gate dielectric and said second gate dielectric is independent of said source and drain dielectrics" as defined by independent claim 11. Therefore, even if one ordinarily skilled in the art had combined Taur with Uesugi, the proposed combination would not teach or suggest the invention defined by independent claims 1 and 11. Therefore, independent claims 1 and 11, and dependent claims 5 and 17 are patentable over the proposed combination of references. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

C. The Rejection Based on Taur in view of Pfister

With respect to the rejection of dependent claim 6, Applicants note that neither Taur nor

Pfiester teach or suggest the structure defined by independent claim 1. More specifically, as shown above, Taur does not teach or suggest "wherein said channel region includes an extension into said source and drain regions" as defined by independent claim 1. Pfiester suffers from the same lack of teaching. There simply is no structure illustrated in Pfiester that would teach or suggest "wherein said channel region includes an extension into said source and drain regions" as defined by independent claim 1. Therefore, independent claim 1 is patentable over the proposed combination of Taur and Pfiester. Further, dependent claim 6 is similarly patentable because of its dependency from claim 1 and because of the additional features it defines. In view of the foregoing, Applicants respectfully request that this rejection be reconsidered and withdrawn.

D. The Rejection Based on Taur in view of Yamanaka

As shown above, Taur does not teach or suggest "wherein said channel region includes an extension into said source and drain regions" as defined by independent claim 1. Further, Yamanaka does not teach or suggest this feature because Yamanaka teaches a substantially rectangular channel region 4 as shown in Figure 1B and therefore cannot teach or suggest that "said channel region includes an extension into said source and drain regions" as defined by independent claim 1. Therefore, Applicants submit that independent claim 1 is patentable over the proposed combination of Taur and Yamanaka.

In addition, independent claim 11 is also patentable over the proposed combination of Taur and Yamanaka. More specifically, as shown above, Taur does not teach or suggest that the "material selection of said first gate dielectric and said second gate dielectric is independent of said source and drain dielectrics" as defined by independent claim 11. In Yamanaka the gate dielectrics 31, 32, 51, 52 are the same dielectrics that separate the source and drain from the gates and cannot present a situation where the "thickness and material selection of said first gate dielectric and said second gate dielectric is independent of said source and drain dielectrics" as defined by independent claim 11. Therefore, Applicants submit that independent claim 11 is also patentable over the proposed combination of Taur and Yamanaka.

Thus, as shown above, independent claims 1 and 11 are patentable over the proposed combination of Taur and Yamanaka. Similarly, dependent claims 9, 10, and 15 are also patentable, not only because they depend from a patentable independent claim, but also because of the additional features of the invention they define. More specifically, in Yamanaka the bottom insulator 30 (Figures 7C and 8A) is formed by implantation of oxygen into silicon. The resulting insulator film that forms from the annealing process is silicon dioxide. Other insulating materials that are not silicon based cannot be realized using the method disclosed in Yamanaka. To the contrary, Applicants bottom insulator 1 can be made of any insulating material because it is formed in a separate processing step, as shown in Applicants' Figure 1, and is not tied to the substrate material as the bottom insulator is in Yamanaka. Therefore, Yamanaka cannot teach or suggest that the first gate dielectric comprises a different material of the second gate dielectric as independent claims 9, 10, and 15. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. Formal Matters and Conclusion

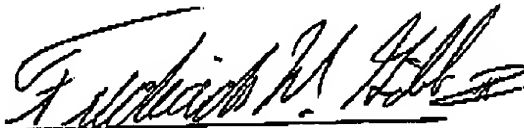
In view of the foregoing, Applicants submit that claims 1-13, 15-20, 44 and 55-74, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit
Account Number 50-0510.

Respectfully submitted,

Dated: 5/5/04


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